

Application No.: 10/074,272
Amendment and Response dated March 29, 2005
Reply to Office Action of January 4, 2005
Docket No.: 1199-4
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REMARKS

Claims 54, 55, 62-78, 80, 81 and 83-118 are currently pending in this application. Claims 54, 81 and 87 have been amended. Claims 79 and 82 have been cancelled. New claims 91-118 have been added, as supported by disclosure on pages 11-13, 16, 22, 25-30, 33, 36, 37 and 40 of the specification, as originally filed. No new matter has been added. Reconsideration is respectfully requested in view of the above amendments and the following remarks.

Applicants' Response to Objection to the Claims

Claim 87 is objected to because the term "active" is considered informal and should read "active component." Applicants have amended claim 87 herein to read "active component."

Applicants' Response to 35 U.S.C. § 112, Second Paragraph Rejection

Claim 54 is rejected under 35 U.S.C. § 112, second paragraph, as allegedly being indefinite. The Examiner asserts that it is not clear if the film is first formed and then placed onto a surface having top and bottom sides or whether the film is formed on the surface. As suggested by the Examiner, Applicants have amended claim 54 herein to recite that the film is formed on the surface. This amendment is supported by disclosure appearing on page 13 of the specification, as originally filed. Accordingly, Applicants respectfully request reconsideration and withdrawal of the Section 112 rejection.

Applicants' Response to 35 U.S.C. § 102 Rejection over Magoon

Claims 54, 55, 63-66, 69-71, 73, 74, 79, 80, 83, 85, 89 and 90 are rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by U.S. Patent No. 4,631,837 to Magoon (hereinafter "Magoon"). Applicants respectfully traverse the rejection on the basis that Magoon fails to disclose each and every element of Applicants' claims, as amended herein.

The Examiner contends that Magoon discloses a process comprising combining a water soluble cellulose derivative polymer component and a polar solvent to form a matrix with a

uniform distribution of components. According to the Examiner, Magoon further discloses forming an ingestible, self supporting flexible film and drying the film by feeding it onto a surface having top and bottom sides. The Examiner further alleges that Magoon teaches the bottom side of the surface is in contact with a heated water bath.

Applicants have amended claim 54 herein to further define the invention. In particular, Applicants have added a recitation in claim 54 that the polymer component is "water-soluble." This amendment is supported by disclosure appearing on page 14 of the specification, as originally filed. Therefore, step (a) of claim 54 requires combining a water-soluble polymer with a polar solvent to form the matrix.

As understood by those skilled in the art, a polymer is "[a] substance composed of very large molecules consisting essentially of recurring long-chain structural units." GRANT & HACKH'S CHEMICAL DICTIONARY 462 (5th ed. 1987) (copies of cited definitions are attached hereto as Exhibits). As amended, claim 54 requires the polymer to be "water-soluble." Those skilled in the art understand "water-soluble" to mean that the polymer is "soluble" in water. "Soluble" means "[c]apable of mixing with a liquid (dissolving) to form a homogenous mixture (solution)." *Id.* at 541. Accordingly, when a substance is dissolved in water, a single-phase liquid solution is formed. Therefore, amended claim 54 requires a polymer component, as provided above, that dissolves in water to form a solution.

Nowhere in Magoon is such a water-soluble polymer disclosed, taught or suggested. Magoon merely teaches application of its drying method to fruit pulp. Contrary to the Examiner's allegations, however, fruit pulp is not a polymer. Moreover, fruit pulp is not water-soluble, i.e., does not dissolve in water to form a solution.

More specifically, fruit pulp is the "pulp" of a piece of "fruit." As commonly understood in the field of art, "fruit" is "[t]he ripened ovary of a plant together with parts of the flower that

share in its development.” *Id.* at 247. Therefore, fruit is not a high molecular weight substance composed of repeating structural units. As such, fruit is not a polymer.

Moreover, “pulp” is understood to be a “mixture of solid particles and liquids.” *Id.* at 480. Magoon recognizes this common meaning, stating that the fruit pulp consists of “solid particles in suspension in a fruit juice.” (Col. 3, lines 43-45). Fruit pulp therefore is a solid material, which accordingly is chewed upon consumption. Fruit pulp is not a substance that dissolves in water. Rather, pulp remains a solid even when mixed with a liquid, i.e., water. Therefore, fruit pulp is not water-soluble.

In view of the above, the fruit pulp dried in Magoon is neither water-soluble nor a polymer. Nowhere in Magoon is forming and drying a film containing a water-soluble polymer disclosed, taught or suggested. Because amended claim 54 requires the step of combining a water-soluble polymer and polar solvent, and the subsequent steps of forming and drying a film therefrom, Magoon fails to teach each and every element of the claim.

Therefore, amended claim 54, and thus any claims that depend therefrom, are not anticipated by Magoon. Applicants respectfully request reconsideration and withdrawal of the Section 102 rejection based on Magoon.

Applicants’ Response to 35 U.S.C. § 103 Rejection over Magoon in view of Wampler

Claims 62, 67, 68, 72, 78, 81 and 86-88 are rejected under 35 U.S.C. § 103(a), as allegedly being obvious over Magoon in view of U.S. Patent No. 5,759,599 to Wampler et al. (hereinafter “Wampler”). Applicants respectfully traverse the rejection on the basis that the combination of references fails to render the claims obvious, as amended herein.

Claims 62, 67, 68, 72, 78, 81 and 86-88 depend from claim 54 and therefore include all the limitations contained therein. As discussed above, Magoon fails to disclose or even suggest

forming a matrix containing a water-soluble polymer, as recited in amended claim 54. Wampler was merely cited for its disclosure related to adding flavor, citric acid and starch to fruit leather. Nowhere in Wampler is formation of a matrix containing a water-soluble polymer, and subsequent drying to produce an edible film, disclosed, taught or suggested. Therefore, Wampler fails to cure the deficiencies of Magoon as a reference.

In view thereof, claims 62, 67, 68, 72, 78, 81 and 86-88 are not obvious in view of the teachings of Magoon in combination with Wampler. Applicants respectfully request reconsideration and withdrawal of the Section 103 rejection based on this combination.

Applicants' Response to 35 U.S.C. § 103 Rejection over Magoon

Claims 75-77 are rejected under 35 U.S.C. § 103(a), as allegedly being obvious over Magoon. Applicants respectfully traverse the rejection on the basis that Magoon fails to render the claims obvious, as amended herein.

Claims 75-77 depend from claim 54 and therefore contain all the limitations contained therein. In addressing Magoon as a Section 102 reference, Applicants have already described in detail that Magoon does not provide nor even suggest forming a matrix containing a water-soluble polymer component, as recited in amended claim 54. For the same reasons that Magoon fails as a reference under 35 U.S.C. §102, the reference fails under 35 U.S.C. §103.

Magoon therefore fails to disclose or suggest each and every element of claims 75-77. Withdrawal and reconsideration of this Section 103 rejection is therefore respectfully requested.

Applicants' Response to 35 U.S.C. § 103 Rejection over Magoon in view of Sharma

Claim 82 is rejected under 35 U.S.C. § 103(a), as allegedly being obvious over Magoon in view of U.S. Patent No. 6,428,825 to Sharma et al. (hereinafter "Sharma"). Applicants respectfully submit that the cancellation of claim 82 obviates this ground of rejection.

Applicants' Response to 35 U.S.C. § 103 Rejection over Magoon in view of Kubodera

Claim 84 is rejected under 35 U.S.C. § 103(a), as allegedly being obvious over Magoon in view of U.S. Patent No. 4,851,394 to Kubodera (hereinafter "Kubodera"). Applicants respectfully traverse the rejection on the basis that the cited combination fails to render the claim obvious, as amended herein.

Claim 84 depends from claim 54 and therefore includes all the limitations contained therein. As discussed above, Magoon fails to disclose or even suggest forming a matrix containing a water-soluble polymer, as recited in amended claim 54. Kubodera was merely cited for its disclosure related to film thickness of 10 mils or less. Nowhere in Kubodera is a matrix containing a water-soluble polymer disclosed, taught or suggested. Therefore, Kubodera fails to cure the deficiencies of Magoon as a reference.

Moreover, Magoon relates to a process for drying fruit whereas Kubodera relates to compositions and films of glucomannan and polyhydric alcohols. There is no suggestion or motivation to combine the teachings of these two unrelated references. *See In re Rouffet*, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1457-58 (Fed. Cir. 1998).

In view thereof, claim 84 is not obvious in view of the teachings of Magoon in combination with Kubodera. Applicants respectfully request reconsideration and withdrawal of the Section 103 rejection based on this combination.

In view of the foregoing, claims 54, 55, 62-78, 80, 81 and 83-118 are now believed to be in proper form for allowance. A favorable reconsideration of the application on the merits is earnestly solicited.

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If the Examiner has any questions regarding this Response, she is encouraged to contact the undersigned attorney.

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Jamie M. Larmann", written over a horizontal line.

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EXHIBIT
GRANT & HACKH'S
**CHEMICAL
DICTIONARY**

[*American, International, European and British Usage*]

*Containing the Words Generally Used in Chemistry,
and Many of the Terms Used in the Related
Sciences of Physics, Medicine, Engineering,
Biology, Pharmacy, Astrophysics,
Agriculture, Mineralogy, etc.*

Based on Recent Scientific Literature

FIFTH EDITION
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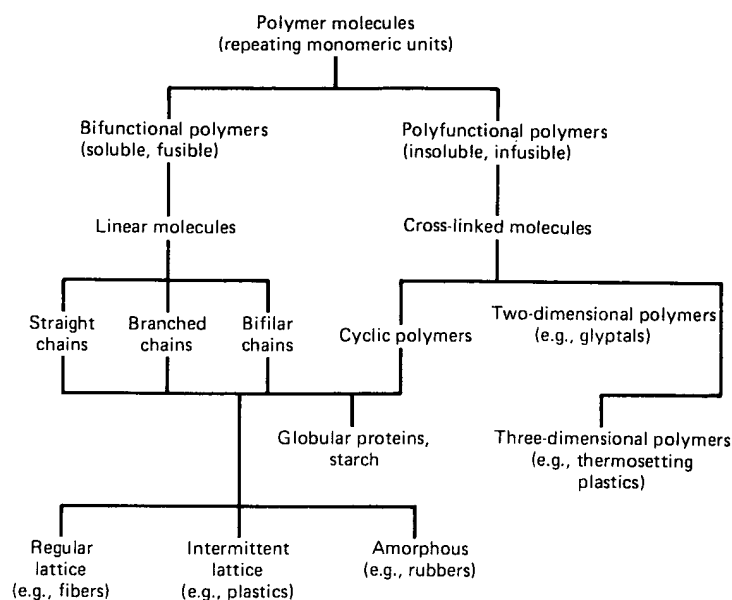


Fig. 18. Classification of polymer molecules.

polyhydric Polyol. A compound containing more than 2 hydroxyl groups.

polyhydron $(H_2O)_n$. A polymer of *hydron*, q.v.

polyisobutylene* PIB*. Poly(1,1-dimethylethylene). The polymer $(-CMe_2 \cdot CH_2-)_n$.

polymer Polymere, polymeride (obsolete). A member of a series of polymeric compounds. A substance composed of very large molecules consisting essentially of recurring long-chain structural units that distinguish polymers from other types of organic molecules, and confer on them tensile strength, deformability, elasticity, and hardness. Monomers, largely derived from coal and oil, are used to build up such polymers. Considerable modification of properties results on introducing a second type of monomer (B) into the main structure (monomer A), producing a *copolymer*, in which the units A and B are arranged completely at random. Alternatively, the A and B units may be arranged in order of long segments, e.g., $\sim A-A-A-A-B-B-B-B-B-A-A-A-A \sim$ (block p.). There are also *branched* polymers, in which the B units branch from the A units; and *cross-linked* polymers, in which 2 A chains are joined by one or a block of B units. Polymeric molecules are classified above in Fig. 18 (after Pinner). Examples of *high* polymers are plastics, fibers, elastomers, human tissue. Cf. *macromolecular chemistry*.

alloy ~ A p. produced by the simultaneous polymerization of 2 substances. Cf. *silicone alloy*. **blocked** ~ See above. **branched-chain** ~ See above. **co** ~ A composite p. prepared by the polymerization of a mixture of 2 or more monomers, or of a monomer and p. of low molecular weight. Cf. *alloy polymer*. **block** ~ A p. built of linearly linked polymeric units. **random** ~ A p. having 2 or more types of units combined in random succession in a linear-chain structure. **cross-linked** ~ See above. **electron-exchange** ~ Redox p. A polymeric structure having several sites capable of accepting or donating electrons. Thus, modified cellulose with redox properties is used as a catalyst to remove oxygen from water to obtain anaerobic conditions.

graft ~ A p. produced by grafting a monomer onto a straight-chain p. to produce a branched-chain p. Thus, a fluorocarbon p. is heated sufficiently to form free radicals on its surface and then dipped into a monomer, e.g., styrene, to produce a graft p. having a printable surface. **high** ~ A p. of high molecular weight, e.g., containing a large number of structural units. **high-trans** ~ A rubbery p. in which a large proportion of the C atoms are arranged in a definite pattern that repeats itself consistently in the chain; as, natural rubber. **homo** ~ See *tactic polymer* below. **inorganic** ~ Inorganic p. structures formed on heating or by catalytic action; as, mica, silicones, inorganic rubber. **irregular** ~ A p. with more than one type of repeating unit. **isotactic** ~ A crystalline p. made from 1-alkenes, in which the substituents in the asymmetric C atoms all have the same configuration relative to the main chain. **linear** ~ A p. in which the molecules are essentially in the form of long chains. **organized** ~ A p. having a regular macroscopic structure, without necessarily showing microcrystallinity. Cf. *polyallomers*. **orientated** ~ A p. film that has been stretched mechanically in 2 directions at right angles to improve its strength properties. **redox** ~ Electron-exchange p. **regular** ~ Tactic p. **super** ~ A p. in which the polymerized molecules have an average molecular weight exceeding 10,000. **tactic** ~ A p. with only one type of repeating unit. See *tacticity*.

P.R. Trade name for a polyamide synthetic fiber.

polymeric Related molecularly to an isomeric compound, but having a multiple of its molecular weight; as, acetylene and benzene. See *polymerism*. **p. dialdehyde** See *starch dialdehyde*.

polymericular weight The molecular weight of a polymer.

polymeride Polymer.

polymerisation Polymerization.

polymerism The property of certain organic compounds which have the same percentage composition, but different molecular weights, the heavier being multiples of the lighter.

Thus, C_2H_2 , C_4H_4 polymerization. molecules of the compound, from not be regenerated aromatic ~ T two or more m from acetylene monosaccharic See *photosynth* rubber, in whi group are pres condensed ~ aldol condensa structural unit measure of th derivatives; d cuprammonio regenerated c ramie pulp 1 that permits creation of p true ~ P. i positions; as polymers (composition atoms.

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TABLE 85. USP SOLUBILITY CLASSIFICATION

Description	Parts of solvent required for 1 part of solute
Very soluble	Less than 1
Freely soluble	1-10
Soluble	10-30
Sparingly soluble	30-100
Slightly soluble	100-1,000
Very slightly soluble	1,000-10,000
Practically insoluble or insoluble	10,000+

temperature. *s. exponent* p or $p_s = \log 1/S$. Cf. *pH*. *s. product* $S = [M^+] \times [X^-]/[MX]$, where the brackets indicate the concentrations of the components of the dissociation equilibrium: $MX \rightleftharpoons M^+ + X^-$. If $[M^+] \times [X^-]$ exceeds S , MX will precipitate; and vice versa. E.g., $NaCl$ is precipitated from concentrated solutions by HCl gas.

soluble Capable of mixing with a liquid (dissolving) to form a homogeneous mixture (solution). Cf. *solubility*, *solution*. *s. barbital* Sodium *barbital*. *s. cotton* Nitrocellulose. *s. glass* Sodium silicate. *s. mercury* $NH_2Hg_2NO_3 = 479.2$. Hahnemann's mercury. Black precipitate on adding ammonia to mercurous nitrate. *s. starch* See *starch soluble*. *s. tartar* Ammonium potassium tartrate*. *s. tartrate* Potassium tartrate.

solum A damp-resisting layer of material installed on the ground under a floor, e.g., bitumen.

solute A substance that mixes with or dissolves in a solvent to produce a solution.

solution (1) Dissolution. The mixing of a solid, liquid, or gaseous substance (solute) with a liquid (the solvent), forming a homogeneous mixture from which the dissolved substance can be recovered by physical processes. (2) The homogeneous mixture formed by the operation of *s. anisotonic* ~ Any nonisotonic *s.*; as, a hypotonic or hypertonic *s.* *aqueous* ~ A *s.* in which water is the main solvent. *buffer* ~ A *s.* of acid or basic salts that can neutralize either acids or bases without appreciable change in hydrogen-ion concentration. *centinormal* ~ A *s.* containing 0.01 equivalents per liter. *chemical* ~ A *s.* in which solute and solvent react to form a compound that dissolves in the solvent and cannot be recovered by distillation. Cf. *physical solution*. *colloidal* ~ A macroscopically homogeneous, microscopically heterogeneous, system of minute particles (colloid, dispersed phase) suspended in a liquid (continuous phase, medium). Cf. *colloid*. *concentrated* ~ A *s.* in which the solute content is relatively great. *decinormal* ~ A *s.* that contains 0.1 equivalents per liter. *dilute* ~ A *s.* in which the solute is relatively small in quantity. *gram molecular* ~ Molar *s.* *heat of* ~ See *heat of solution*. *hypertonic* ~ A *s.* whose osmotic pressure is greater than that of blood serum. *hypotonic* ~ A *s.* whose osmotic pressure is less than that of blood serum. *ionic* ~ A *s.* whose ions of the solute are surrounded by oriented molecules of the solvent. *isotonic* ~ A *s.* having an osmotic pressure equal to that of blood serum; as, 0.9% w/v sodium chloride *s.* *molar* ~ A *s.* containing 1 g molecule (mole) of substance per 1,000 g of *s.* *molar* ~ A *s.* containing 1 g molecule of substance per liter. Cf. *normal solution*. *molecular* ~ A true *s.* in which the molecules of solute are surrounded by molecules of solvent. Cf. *colloidal solution*, *ionic solution*. *normal* ~ A *s.* containing 1 gram equivalent per liter. *normal salt* ~ A *s.* containing 1 mole sodium chloride per liter. Cf. *isotonic*

solution Liquefaction of a gel; the reverse of gelation.

solbrol Nipagin M.

solder Braze. A fusing metal or alloy used to unite adjacent surfaces of less fusible metals. *brass* ~ Copper *s.* *copper* ~ An alloy: Sn 5, Pb 2 pts., with zinc chloride as flux. *fine* ~ Soft *s.* *fusible* ~ An alloy of Pb, Sn, and Bi, which melts in water; used in spray fire extinguishers. *gold* ~ An alloy: Au 10, Ag 6, Cu 4 pts. *hard* ~ A high-melting-point alloy used as *s.*; it fuses at red heat: e.g., Cu + Zn + Ag. *lead* ~ An alloy of equal parts of Pb and Sn, used for soldering lead. *plumber's* ~ An alloy usually containing approx. Pb 65, Sn 30%, with some Sb. *seifert* ~ A *s.* for aluminum, containing Sn 73, Zn 21, Pb 5%. *silver* ~ See *silver solder*. *soft* ~ A *s.* that fuses below red heat; as, Sn + Pb; *lead s.* (above), *fusible s.* *zinc* ~ An alloy: Sn 5, Pb 3 pts.

soldering (1) Uniting metallic pieces by heat with or without an alloy (solder) and flux (borax). (2) In commerce, soft (as distinct from hard) solders. *S.* differs from *brazing* and *fusion welding*, q.v. *autogenous* ~ Uniting metal surfaces by interdiffusion, without a more fusible alloy. *fusing* ~ Uniting metal surfaces by filling all intervening space with a completely fused solder. *sweating* ~ *S.* in which the solder is heated near its melting point and adheres.

solenhofen stone A fine-grained, porous limestone; contains clay.

solenoid A hollow cylinder, wound with resistance wire; used to produce fields of electric force, as to operate a valve.

solfatara A volcanic vent from which sulfur is obtained.

solferino Fuchsin.

solid (1) A substance of definite shape, and relatively great density, low internal enthalpy, and great cohesion of its molecules. It may be homogeneous (as crystals and solid solutions) or heterogeneous (as amorphous and colloidal substances). *s. solution* (1) Solsolid. A homogeneous, *s.* mixture of substance; as, glass. (2) A *s.* solution of a solid, liquid, or gas in a solid. *s. state* Describing electronic components that utilize electronic and magnetic properties of solids.

solidago Goldenrod. The dried herb of *Solidago odora* (Compositae); a carminative.

solidify To change into the solid state.

solidifying point Freezing point.

solidus In a temperature-concentration diagram for both solid and liquid solutions whose concentrations differ, the *s.* curve relates to the solid phase, and the *liquidus* to the liquid phase.

soliquid Suspension. A dispersed system of a solid phase in a liquid phase.

soln. Abbreviation for solution.

solodization Dealkalization. Removal of alkali from soils by degradation.

Solozone Trademark for a brand of hydrogen peroxide.

solubility The extent to which a substance (solute) mixes with a liquid (solvent) to produce a homogeneous system (solution). The classification used by the United States Pharmacopeia is shown in Table 85. *apparent* ~ The total amount of undissociated and dissociated portions of a substance dissolved in a liquid. *degree of* ~ The concentration of a saturated solution at a given temperature. *S.* generally increases with increase in temperature. *molar* ~ c/M , where c is the g/L and M the molecular weight. *real* ~ The amount of undissociated solute in a liquid.

s. curve A graph obtained by plotting the amount of dissolved substance in a saturated solution against the

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friedelin $C_{30}H_{50}O = 426.7$. A sterol from cork related to the hydrocarbon $C_{30}H_{52}$.

Friedrichs **F. condenser** A condensing worm surrounded by a glass or metal tube. **F. gas bottle** A glass cylinder with a spiral tube for washing gases.

friezeite Ag_2FeS_8 . A rare, native sulfide.

frigorific Describing an agent that produces coldness. **f. mixture** Freezing mixture.

Frilon Trademark for a polyamide synthetic fiber.

fringes The dark, parallel, equidistant lines observed in the interferometer.

frit (1) Enamel. A complex alkaline borosilicate glass, usually containing fluorine, produced by melting a mixture such as borax, feldspar, quartz, and cryolite. (2) To sinter.

fritt, frittered Having been heated near the melting point.

f. glass Glass powder heated sufficiently for the particles to adhere together without coalescing completely; used in filters.

fritting Becoming pasty and beginning to melt; as, some soft coals.

Froehde reagent A reagent for alkaloids: 5 mg molybdic acid in 1 mL hot concentrated sulfuric acid.

frontier orbital See *frontier orbital* under *orbital*.

frost Dew produced in frozen form. **hoar** \sim F. produced at a dew point of less than 0°C .

froth Foam. **iron** \sim Spongy hematite.

frother A chemical used in the flotation process. Thus, pine oil produces a thin transient foam; cresylic acid, a heavy permanent foam.

frothing Foaming. **f. agent** A substance which produces a froth when shaken with a liquid; as, saponin.

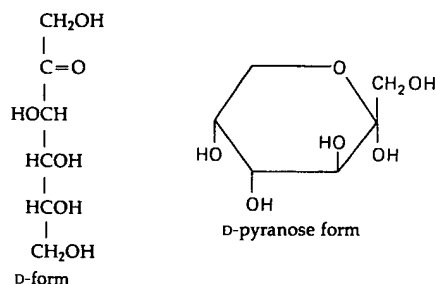
F.R.S. Abbreviation for Fellow of the Royal Society (London).

F.R.S.C. Abbreviation for Fellow of the Royal Society of Chemistry (London).

fructofuranosidase* β -D- \sim See *invertase*.

fructosans Sugar anhydrides which hydrolyze to fructose. Cf. *hemicellulose*.

fructose $C_6H_{12}O_6 = 180.2$. Levulose, fruit sugar, D-fructose, L-fructose. A carbohydrate in sweet fruits and honey. Colorless needles, m. 103, soluble in water, alcohol, or ether; a preservative; an intravenous infusion in parenteral feeding (USP, EP, BP). **inactive** \sim Fructose, acrose, or formose. An unfermentable carbohydrate formed by polymerization of formaldehyde in limewater. **L-** \sim D-Fructose. m. 102. **pseudo** \sim Psicose.



fructoside A glucoside which hydrolyzes to fructose.

fruit The ripened ovary of a plant together with parts of the flower that share in its development. Some used in traditional remedies; e.g., anise, caraway, fig, hops, orange, pepper, vanilla. See also *seeds*. **f. essence** An artificial mixture imitating the taste of a fruit and consisting of esters of alkyl radicals with organic acids, usually in dilute alcoholic

solution. **f. oil** See *oil*. **apple** \sim Chiefly pentyl valerate. **banana** \sim Chiefly pentyl acetate. **pear** \sim Chiefly pentyl acetate. **pineapple** \sim Chiefly ethyl butyrate. **f. sugar** Fructose.

frusemide EP, BP name for furosemide.

ft Abbreviation for foot. $\text{ft}^2 = \text{square foot}$. $\text{ft}^3 = \text{cubic foot}$.

fuberidazole* See *fungicides*, Table 37.

fuchsin $C_{20}H_{19}N_3HCl = 337.8$. Magenta red, C.I. Basic Violet 1A, rosaniline hydrochloride, aniline red, azaleine, harmaline, rosein, erythrobenzene, rubine, solferino. A red dyestuff, a mixture of the hydrochlorides of rosaniline and pararosaniline. Red rhombs, with green fluorescence, soluble in water; a dyestuff, coloring matter for inks and microscopical stains. **acid** \sim A mixture of the disulfonic and trisulfonic acids of pararosaniline; a dye and stain.

English \sim A mixture of the acetates of rosaniline and pararosaniline; a dyestuff. **German** \sim Fuchsin.

fuchsite $H_2KAl_3(SiO_4)_3Cr$. A variety of muscovite.

fuchsone $O:C_6H_4:C(C_6H_5)_2 = 258.3$.

4-(Diphenylmethylene)-2,5-cyclohexadien-1-one. Brown crystals, m. 167. An intermediate in the manufacture of rosaniline dyes.

fucitol $C_6H_{14}O_5 = 166.2$. **D-** \sim D-1-Deoxygalactitol. A sweet alcohol, m. 153, from fucus.

fucoiden A mucilaginous constituent of seaweed, $R^1-R^2-O-SO_3M$, where R^1 is fucose, R^2 another carbohydrate complex, and M is Na, K, Mg, or Cu.

fucosan A fucose polymer in the cell walls of marine algae.

fucose $C_5H_9MeO_5 = 164.2$. 6-Deoxygalactose. **D-** \sim From glycosides in Convolvulaceae spp., m. 142. **L-** \sim From frog spawn, sea urchin, milk. m. 141.

fucosite The least water-soluble portion of seaweed, containing fucose, algarose, and an oil. **pseudo** \sim Elkerite.

fucoxanthin $C_{42}H_{58}O_6 = 658.9$. Fucoxanthinol acetate. A carotenoid pigment of brown algae. Red crystals, m. 168.

fucosamide Fucosine.

fucosine $C_{15}N_{12}O_3N_2 = 268.3$. Fucosamine. A crystalline alkaloid from fucus.

fucosol $C_5H_4O_2 = 96.1$. A colorless oil, resembling furfuraldehyde.

fuel A material that furnishes heat on combustion.

Classification: (1) *Natural or solid f.*; as, wood, peat, lignite, coal, q.v. (2) *Prepared or dried f.*; as, briquets and compressed fuels. (3) *Liquid f.*; as, petroleum, gasoline. See Table 36 on p. 248. (4) *Gaseous f.*; as, coal or water gas. **fossil** \sim F. derived from coal, lignite, peat, natural gas, oil, shales, or tar sands.

Fras \sim See *Fras fuel*. **metallic** \sim Finely powdered magnesium or aluminum. Cf. *Thermit*. **pulverized** \sim Ground furnace fuel; typically 80% below $200\ \mu\text{m}$.

f. cell A means of converting chemical energy, as, of a chemical reaction, into electrical energy by reverse electrolysis; e.g., the catalytic conversion of H and O into water. **f. equivalence** Several conventions exist for converting different fuels into common energy units. Often in the U.S., oil is expressed as "oil equivalent (o.e.)," based on 10,000 kcal/kg net, and coal as "hard coal equivalent (c.e.)," based on 7000 kcal/kg net. Thus 1 ton c.e. = 0.7 ton o.e. (See *net calorific value* under *calorific*). Other fuels, as gas, are equated to these units on the basis of their thermal content. Nuclear and hydro power are also expressed as o.e. or c.e., on the basis of the notional amount of these fossil fuels needed to produce the same power output in a conventional steam power station. **f. gases** The compressed gases used for welding and cutting metals; as, blaw gas, butane, coal gas. **f. oil** Crude petroleum.

fugacity The escaping tendency of a substance in a

psicose $\text{CH}_2\text{OH}\cdot\text{CO}\cdot(\text{CHOH})_3\cdot\text{CH}_2\text{OH} = 180.0$. Allulose, D-ribo-2-oxohexose. An epimer of (+)-fructose. A reducing, nonfermentable constituent of cane sugar molasses. Cf. *glucose*.

psig Abbreviation for pounds per square inch gage; a unit of pressure.

psilocin A hallucinogenic indole occurring in some mushroom species.

psilomelane $(\text{Ba}\cdot\text{H}_2\text{O})_2\text{Mn}_5\text{O}_{10}$. A hydrated pyrolusite (Saxony, Germany).

psophometer A device to measure signal-to-noise ratios in communications systems.

psoralens Substances found in plants, as bergamot and parsley, that have a photosensitizing effect. They have a coumarin molecule with a furan ring. See *PUVA treatment*.

psoraline Caffeine.

psychedelic A mind-expanding drug; as LSD.

psychomimetic Describing drugs that produce hallucinations and psychotic states.

psychotrine $\text{C}_{28}\text{H}_{36}\text{O}_4\text{N}_2 = 464.6$. An alkaloid in ipecac.

psychrometer See *hygrometer*. *sling* ~ Whirling hygrometer.

psychrometric chart A chart showing the drying temperature plotted against the weight of water vapor removed per unit weight of dry air.

psychrophilic Describing organisms of optimum growth at temperature 4–10°C. Cf. *mesophilic*.

psylla p. alcohol Tritriacontanol*. p. wax A solid wax from the leaf house, *Psylla alni*.

psyllic p. acid Tritriacontanoic acid*. p. alcohol Tritriacontanol*.

psyllostearyl alcohol Tritriacontanol*.

psyllostearylic acid Tritriacontanoic acid*.

pt Abbreviation for (1) pint; (2) part.

pteridine* $\text{C}_6\text{H}_4\text{N}_4 = 132.1$. A diaminopyrimidine derivative. Yellow plates, m.140, soluble in water (violet fluorescence).

Pteridophyta A main division of Cryptogamia, as Filices (ferns), Equisetaceae (horsetails), Lycopodiaceae (club mosses).

pterin A yellow purine pigment from mammalian tissues. Cf. *rhodopterin*.

pterocarpine An alkaloid from red sandalwood, *Pterocarpus santalidus* (Leguminosae).

ptyergospermin The antibacterial principle from *Moringa pterygosperma*, Gaertn.

ptyroglutamic acid Folic acid.

PTFE* Symbol for poly(tetrafluoroethylene)*.

ptomaine Animal, cadaveric, or putrefactive alkaloid. Any of the amino compounds that result from the decomposition of proteins by microorganisms; e.g.: aminovaleric acid (meat), cadaverine (animal tissues), diethylamine (fish), morrhucic acid (cod-liver oil), mydine (human tissue), tetanine (cultures of tetanus bacillus), tyrotoxine (dairy foods).

ptyalase α -Amylase*.

ptyalin α -Amylase*.

Pu Symbol for plutonium.

pucherite BiVO_4 . A mineral.

puddle, puddling (1) The conversion of cast iron into wrought iron by fusion in a reverberatory furnace, in contact with the hematite lining of the furnace, where oxidation of carbon to carbon monoxide occurs. (2) Clay, moistened and well-worked.

puering Bating. The cleaning of depilated leather hides, by the action of tryptic enzymes.

pukateine $\text{C}_{17}\text{H}_{17}\text{O}_3\text{N} = 283.3$. An apomorphine alkaloid found in *Laurelia novae zealandiae*. Cf. *laureline*.

pulegium The Labiatae *Hedeoma pulegoides* (American p.) and *Mentha pulegium* (European p.).

pulegol $\text{C}_{10}\text{H}_{18}\text{O} = 154.3$. 3-Menthenol. 2-Isopropylidene-5-methylcyclohexanol. From the essential oils of *Mentha pulegium* (Labiatae).

pulegone $\text{C}_{10}\text{H}_{16}\text{O} = 152.2$. 3- $\Delta^{4(8)}$ -Menthenone. An aromatic ketone in oil of hedeoma. Colorless liquid, d.0.932, b.221, insoluble in water.

Pulfrich refractometer A refractometer used especially for oils and fats.

pullulan A poly- α -1,6-maltotriose.

pullulanase* An enzyme which hydrolyzes 1,6- α -D-glucosidic linkages in pullulan, amylopectin, and glycogen.

pulp Any soft mixture of solid particles and liquids as, *paper pulp*. dissolving ~ A p. similar to, but purer than, that for paper; used to produce viscose rayon and high-tenacity tire cord.

pulpwood A raw material for paper pulp manufacture, as, conifer trunks.

pulque The fermented sap of an *Agave* species (Mexico). Cf. *mescal*.

pulsatance See Table 88, Group B, footnote b, on p. 266.

pulse The edible seeds of leguminous plants; as, peas, lentils.

pulverization The reduction of a substance to a powder.

pulverizing Powdering.

pulvinate (1) Convex or cushion-shaped, as a colony of bacteria. (2) A salt of pulvinic acid.

pulvinic acid $\text{C}_{18}\text{H}_{12}\text{O}_5 = 308.3$. Orange pigment from lichen spp. *p,p'*-dihydroxy ~ Atromentin.

pulvis Latin for "powder."

pumice (stone) A light, porous stone of volcanic origin, which consists of the silicates of aluminum, sodium, and potassium; an abrasive and catalyst base (USP).

pump A machine for drawing or forcing liquids or gases from one container or level into another. *acid* ~ See *acid pump*. *air* ~ See *air pump*. *backing* ~ A low-power p. to produce a low pressure or partial vacuum in preparation for a high-power booster p. *filter* ~ A low-power p. operated by a water faucet. *heat* ~ See *heat pump*. *Hickmann* ~ See *vacuum pump*. *mercury* ~ See *Sprengel pump*. *metering* ~ Type of p. used to add chemicals to a process at a controllable level; as, mono and Moyno p. *suction* ~ Filter p. *Töpler* ~ A p. that removes air by entrainment between drops of mercury falling in a tube. *vacuum* ~ See *vacuum pump*.

pumpkin seed Pepo. The seeds of varieties of *Cucurbita pepo*; an anthelmintic.

punctiform Describing a bacterial colony, near the limit of natural vision.

pungent Sharp or biting, as a p. odor.

punicic acid $\text{C}_{18}\text{H}_{30}\text{O}_2 = 278.4$. (9Z,11E,13Z)-9,11,13-Octadecatrienoic acid*. m.44, from the seed oil of *Punica granatum*, pomegranate (Punicaceae).

punicine (1) Pelletierine. (2) A purple oxidation product of colorless shellfish juices.

pure Free from contamination. *bacteriologically* ~ Containing no live bacteria. *chemically* ~ Containing no other substance. Cf. *chemicals*.

purgatin Purgatol.

purgative An agent that causes evacuation of the bowels; as, castor oil.

purgatol $\text{C}_{14}\text{H}_5\text{O}_2(\text{OH})(\text{C}_2\text{H}_5\text{O}_2)_2 = 340.1$. Purgatin, anthrapurpurin diacetate. Orange crystals, m.177, insoluble in water; a purgative.

purine* $\text{C}_5\text{H}_4\text{N}_4 =$

Colorless needles, See *endogenous purines*.

p. alkaloids Pur alkaloids derived from dioxopurine (xanthine) b. are hydrolytic products of animal waste products heterocyclic arrangement. p. skeleton. PuriNethol Trad purinometer A

urine. purinone Hypoxanthine See *chem*. Purkinje (Purkyne) physiologist. P. increasing intensity of other spectral colors. purone $\text{C}_5\text{H}_8\text{O}_2$ tetrahydropurine by electrolysis.

purple A reddish antique ~ Dibr. The photosensitizer sensitizes the eye rhodopsin.

p. carmine M oxide with also mixture of solution used in the maroon copper Bornite. purpureo Descriptive bivalent metals pentammine, [where X is a halogen] salts of the type purpuric acid uric acid, relate purpurin $\text{C}_{14}\text{H}_{10}\text{N}_4$ Trihydroxyanthraquinone of madder; also (decomp.), soluble purpurogallin or hydrolysis product of erioerythrin, purpuroxanth purpuroxanth purree India purreic acid purr(en)one pus A liquid and leukocytes Blue p. produ

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